CLAIMS

1. A method for optimizing quality of a data signal transmitted over an optical WDM network, comprising:

generating, at a transmit site, a FEC encoded optical signal, by intensity modulating said data signal over an optical carrier;

phase modulating said optical signal with a prechirp signal;

transmitting said optical signal from said transmit site to a receive site;

recovering said data signal from said optical signal at a receive site;

determining a degradation factor indicative of the distortion suffered by said optical signal between said transmit and said receive sites; and

controlling the amplitude of said prechirp signal with said degradation factor.

2. A method as claimed in claim 1, wherein said phase modulating step includes modulating said optical signal with an independent phase modulation signal over the intensity modulation signal.

3. A method as claimed in claim 1, wherein said step of determining a degradation factor comprises FEC decoding said optical signal and counting the number of errors corrected in said optical signal.

4. A method as claimed in claim 3, wherein controlling the amplitude of said prechirp signal comprises:

transmitting said degradation factor from said receive site to said transmit site;

processing said degradation factor into a control signal corresponding to an optimal prechirp; and

synchronizing said control signal with said optical signal.

5. A method as claimed in claim 4, wherein said degradation factor is transmitted over a telemetry feedback link.

6. A method as claimed in claim 4, wherein said degradation factor is transmitted over an optical service channel.

7. A method as claimed in claim 4, wherein said degradation factor is transmitted over a data communication channel.

8. A method as claimed in claim 4, wherein said optimal prechirp is determined according to a Q versus prechirp graph provided by measuring the quality factor Q of said optical signal at said receive site for a plurality of given prechirp levels, and selecting said optimal prechirp associated with a maximum Q on said graph.

9. A method as claimed in claim 1, further comprising storing said optimal prechirp in a memory.

10. A method as claimed in claim 9, wherein said optimal prechirp is used for the life of said optical signal.

11. A method as claimed in claim 10, wherein said optimal prechirp is reassessed as desired during the life of said optical signal.

12. A method as claimed in claim 4, wherein said receive site is a first optical switch, and said optimal prechirp is used to optimize transmission of said optical signal between said transmitter and said first optical switch.

13. A method as claimed in claim 12, wherein said transmit site is a first optical switch and said receive site is a second optical switch, and said optimal pre-chirp is used to optimize transmission of said optical signal between said first optical switch and said second optical switch.

14. A method as claimed in claim 12, wherein said transmit site is an optical switch site, and said optimal prechirp is used to optimize transmission of said optical signal between said optical switch and said receive site.

15. A method for optimizing quality of a plurality of data signals transmitted over an optical WDM network, comprising, for each data signal:

generating, at a transmit site, a respective FEC encoded optical signal, by intensity modulating a respective data signal over an associated optical carrier;

phase modulating said respective optical signal with a respective prechirp signal;

transmitting said respective optical signal from said transmit site to a receive site;

recovering said respective data signal from said respective optical signal at said receive site;

determining a respective degradation factor indicative of the distortion suffered by said respective data signal between said transmit and said receive sites; and

controlling the amplitude of said respective prechirp signal with said degradation factor.

16. A method as claimed in claim 15, wherein said step of transmitting includes multiplexing all said respective optical signals into a WDM signal at said transmit site, launching said WDM signal towards said receive site and demultiplexing said WDM signal at said receive site to obtain said respective optical signals.

17. A method as claimed in claim 15 wherein said step of determining a degradation factor comprises FEC decoding each said respective optical signal and counting a respective number of errors corrected in each said data signal.

18. A method as claimed in claim 17, wherein controlling the amplitude of said prechirp signal comprises:

transmitting each said respective degradation factor from said receive site to said transmit site;

processing each said respective degradation factor into a respective control signal of an optimal prechirp; and

synchronizing said respective control signal with said respective optical signal.

19. A method as claimed in claim 18, wherein each said respective degradation factor is transmitted over a respective telemetry feedback link.

20. An optical transmitter for a WDM network comprising:

means for generating an optical signal by intensity modulating a data signal and launching same over an optical transmission medium;

a phase modulator for phase-modulating said optical signal with a prechirp signal;

a controller for receiving a signal degradation factor indicative of the degradation of said optical signal along said transmission medium and adjusting said prechirp signal accordingly.

21. An optical transmitter as in claim 20, wherein said phase modulator is a single-ended waveguide section for routing said optical signal while applying said prechirp signal on an electrode placed along said waveguide.

22. An optical transmitter as claimed in claim 21, further comprising a variable gain electrical amplifier for controlling the level of said prechirp signal according to a number of errors corrected in said data signal at said receive end.

23. An optical transmitter as claimed in claim 22, wherein said variable gain electrical amplifier is synchronized with the data clock.

24. An optical transmitter as claimed in claim 20, wherein said means for generating is a Mach-Zehnder modulator for routing a continuous wave (CW) along two waveguides and applying said data signal on an electrode along one of said waveguides.

25. An optical transmitter as claimed in claim 20, wherein said controller is a microprocessor comprising means for converting said degradation factor into said prechirp signal and a memory for storing an optimal level of said prechirp signal.

26. An optical transport system for optimizing the quality of an optical signal transmitted over an optical channel, comprising:

means, at the transmitter, for modulating an optical signal with a modulation prechirp signal;

means, at the receiver, for calculating a signal degradation factor and a corresponding value of said signal quality;

a telemetry feedback link for feeding said signal degradation factor to the transmitter;

means for modifying said prechirp signal over a predetermined range of system operation so as to obtain a plurality of prechirp levels and corresponding values of said signal quality;

means for storing said plurality of prechirp levels and corresponding values of said signal quality;

means for comparing and determining a maximum channel value of said signal quality,

whereby an optimal channel prechirp corresponding to said maximum channel value of said signal quality is derived.

27. The system of claim 26, further comprising processing means for receiving said degradation factor and for outputting a signal to control said prechirp level responsive to said signal degradation factor.

28. The system of claim 26, wherein said signal degradation factor is the sum of FEC corrected errors over a period of time.

29. The system of claim 26, wherein said telemetry feedback link is used only during installation and said optimal channel prechirp level is locked in for the life of said system.

30. The system of claim 26, wherein said prechirp signal is a sinusoidal signal synchronized with the system clock.

31. The system of claim 28, wherein said errors are calculated by monitoring a timing jitter for a non return to zero (NRZ) transmission mode.

32. The system of claim 28, wherein said errors are calculated by monitoring the dispersed energy between pulses for a return to zero (RZ) transmission mode.

33. The system of claim 26, wherein said optimal channel prechirp compensates for dispersion slope at each wavelength independently of the net link dispersion.

34. The system of claim 26, wherein said optical transport system is a WDM system.

35. The system of claim 26, wherein said predetermined range of system operation covers all worst-case degradation limits.